

Managing Risk in Farming: Concepts, Research, and Analysis.

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Abstract

The risks confronted by grain and cotton farmers are of particular interest, given the changing role of the Government after passage of the 1996 Farm Act. With the shift toward less government intervention in the post-1996 Farm Act environment, a more sophisticated understanding of risk and risk management is important to help producers make better decisions in risky situations and to assist policymakers in assessing the effectiveness of different types of risk protection tools. In response, this report provides a rigorous, yet accessible, description of risk and risk management tools and strategies at the farm level. It also provides never-before-published data on farmers' assessments of the risks they face, their use of alternative risk management strategies, and the changes they would make if faced with financial difficulty. It also compares price risk across crops and time periods, and provides detailed information on yield variability.

Keywords: Crop insurance, diversification, futures contracts, leasing, leveraging, liquidity, livestock insurance, marketing contracts, options contracts, production contracts, revenue insurance, risk, vertical integration.

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Summary

The risks confronted by grain and cotton farmers are of particular interest, given the changing role of the Government after passage of the 1996 Farm Act. With the shift toward less government intervention in the post-1996 Farm Act environment, a more sophisticated understanding of risk and risk management is important to help producers make better decisions in risky situations and to assist policymakers in assessing the effectiveness of different types of risk protection tools. In response, this report provides a rigorous, yet accessible, description of risk and risk management tools and strategies at the farm level.

Risk is uncertainty that affects an individual's welfare, and is often associated with adversity and loss. There are many sources of risk in agriculture, ranging from price and yield risk to the personal risks associated with injury or poor health. In dealing with risky situations, risk management involves choosing among alternatives to reduce the effects of the various types of risk. It typically requires the evaluation of tradeoffs between changes in risk, changes in expected returns, entrepreneurial freedom, and other variables.

Several surveys have been conducted asking about the types of risk most important to farmers. These surveys reach similar conclusions. A 1996 USDA survey, for example, indicates that producers are most concerned about changes in government laws and regulations (institutional risk), decreases in crop yields or livestock output (production risk), and uncertainty in commodity prices (price risk). In general,

producers of major field crops tend to be more concerned about price and yield risk, while livestock and specialty crop growers are relatively more concerned about changes in laws and regulations.

While concerns about risk vary across types of producers, other factors are also important in determining the risk inherent in a producer's situation. Yield risk, for example, varies regionally, and depends on soil type, climate, the use of irrigation, and other variables. Yield risk tends to be low in California, where irrigation is widespread, and higher in dryland producing areas in the Great Plains. In contrast to yield risk, price risk for a given commodity tends not to vary geographically, and depends on such factors as commodity stock levels and export demand.

Farmers have many options in managing agricultural risks. They can adjust the enterprise mix (diversify) or the financial structure of the farm (the mix of debt and equity capital). In addition, farmers have access to many tools—such as insurance and hedging—that can help reduce their farm-level risks. Off-farm earnings are a major source of income for many farmers that can help stabilize farm household income. Indeed, most producers combine the use of many different strategies and tools.

Because farmers vary in their attitudes toward risk, risk management cannot be viewed within a “one size fits all” approach. That is, it is not wise to say that “All Midwestern corn farmers should hedge 50 percent of their crop in futures,” or that “No farmer should

plan to obtain more than two-thirds of his or her income from a single commodity.” Different farmers confront different situations, and their preferences toward risk and their risk-return tradeoffs have a major effect on decisionmaking in each given situation. A large, industrialized operation, for example, may hire marketing expertise to directly use hedging and options, while a smaller farmer may prefer to forward contract with other parties better able to hedge directly.

Although farmers in similar situations can differ greatly in their response to risk, surveys provide an overall view of producer choices. The results of a 1996 survey, conducted shortly after passage of the 1996 Farm Act, indicate that operators in the largest gross income categories (more than \$250,000 annually) are more likely to use virtually all risk management strategies than small-scale operators. Keeping cash on hand for emergencies and good buys was the number one strategy for every size farm, for every commodity specialty, and in every region.

Evaluating the effectiveness of different strategies and tools requires

an understanding of the risk-return tradeoffs of individual producers. Several major points can be made, however, that generally apply to risk management. Most of the tools discussed in this report tend to reduce intrayear income uncertainty, but may have only small or negligible effects on multiyear uncertainties. In addition, some strategies—such as the combined use of insurance and forward pricing—tend to complement each other in reducing risks.

In short, understanding risk in farming is important for several reasons. First, most producers are averse to risk when faced with risky outcomes. Someone who is risk averse is willing to accept a lower average return for lower uncertainty, with the tradeoff depending on the person's level of risk aversion. Thus, strategies cannot be evaluated solely in terms of average or expected return, but also must consider risk. Second, understanding risk helps farmers and others develop strategies for mitigating the possibility of adverse events, and aids in circumventing extreme outcomes, such as bankruptcy.



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Farming is a financially risky occupation. On a daily basis, farmers are confronted with an ever-changing landscape of possible price, yield, and other outcomes that affect their financial returns and overall welfare. The consequences of decisions or events are often not known with certainty until long after those decisions or events occur, so outcomes may be better or worse than expected. When aggregate crop output or export demand changes sharply, for example, farm prices can fluctuate substantially and farmers may realize returns that differ greatly from their expectations.

The risks confronted by grain and cotton farmers are of particular interest given the changing role of the Government after passage of the 1996 Farm Act. The Act eliminated deficiency payments which, between 1973 and 1995, provided program crop producers with price and income support in years of low prices. Now, participating crop producers instead receive contract payments, which are fixed amounts scheduled to decline over time between 1996 and 2002. Unlike deficiency payments, these

contract payments do not vary inversely with market prices. The 1996 Farm Act also eliminated annual supply management programs, providing producers with the flexibility to plant any crop (with certain restrictions for fruits and vegetables) on any acre. The Act also reduced government intervention in dairy markets.

This shift toward less government intervention in the post-1996 Farm Act environment creates a need for a more sophisticated understanding of risk and risk management. In response, this report provides a rigorous, yet accessible, description of risk and risk management tools and strategies. It describes risk at the farm level, examining situations facing individual producers. It is designed for risk program managers, extension educators, farmers and other business people, and others interested in risk and risk management issues. Understanding risk is a key element in helping producers make better decisions in risky situations, and also provides useful information to policymakers in assessing the effectiveness of different types of risk protection tools.